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VOLUME IV NUMBER 10

THE ELEMENTARY SCHOOL TEACHER

JUNE, 1904

TRUE NATURE STUDY.

WE have at last reached a stage of advancement when nature-study bids fair to become a subject possessing live and genuine interest. It has taken fifteen years to make even an impression upon two great ideas that have stood like a granite wall between the student and nature. One of these ideas must be charged up to the theologians, and the other to the scientists. Under the first, it was taught that living things are to be estimated in terms of their direct usefulness to the selfish interests of man. It was flattering to human vanity thus to view creation, but it was not always easy to make the facts square with the theory, and the great classification of the useful and the useless gradually grew up. Everything included in the former was studied with a patronizing air that sometimes developed a maudlin sentimentality; the latter class were studied only to be destroyed. As a result of this supposed preordained slavelike relationship to man, it was natural for the student to get the idea that all the so-called lower animals, as to intelligence, were to be regarded as more or less idiotic human beings; whereas the fact is that the members of the animal world, each in his own sphere, are supremely wise.

The obstacle set up by the scientist is found in the idea of types. With the scientist, the individual has counted for little except as it contributed to the creation of a figment of the imagination known as a *type*. There has been produced only occasionally a text-book in science that is not given over body and soul to the worship of types. One of the chief differences between such science work and the better forms of nature-study is found in this: science has been chiefly concerned in discovering points of similarity for the sake of huddling together as many individuals as possible into a group, class, or genus; whereas nature-study of the best kind is just as much, or more, concerned about individual differences as it is about likenesses. As applied to living things, whether animals or plants, it is becoming more and more a study of personal characteristics. There is no doubt that science is trending in the same direction; this is shown by the tendency to split up once well-defined species into an indefinite number of varieties, which is the result of a closer study of individuals. Observers are learning that, for example, when they have found out the correspondence that exists among the bones of all the birds — or all the vertebrates, for that matter — they have not yet begun to observe the most interesting part about the animal, namely, how the *individual* solves the *personal problems* that must come up in his life. It is clear that the *personal* characteristics must be more important and more interesting than those of a general nature which may be termed racial. They are more important, because it cannot be supposed that the inherited traits which were acquired in past ages, when conditions were different, will embody enough wisdom to enable the being, either brute or human, to solve successfully the particular problems which meet him today. Living things vary because conditions change; the variation is, therefore, individual, not racial. The most unfortunate thing that could happen to the individuals of a group, plant or animal, brute or human, would be to be created exactly alike and all having precisely the same ways of doing things. The members of such a group of any size could not survive more than a generation or two. Conversely, the most fortunate thing in life is to be born just different enough from everything else to have an individual and a unique point of view; to have novel ways of getting results; to have the power to see the "other side" of matters which engage general attention; to be able to utilize what other things waste; to save easily where another is compelled by nature to spend. These are personal attributes which make for robustness and virility in the individual, and it is through such that the race survives. Every individidual born into the world therefore may be regarded as the orginal progenitor of a new line of individuals which are remarkable, not for their many points of similarity, but for the power that each possesses to vary from all the others. It is by reason of these fortunate unlikenesses that have constantly occurred that the earth is filled today with living forms, the infinite diversity of which strongly attests the importance of being unlike.

About a year ago, Mr. Caspar Whitney, in *Outing,* commenting upon the recent controversy between Mr. Burroughs and Mr. Long, states the case so fairly and well that the liberty is taken to quote at length from his editorial. He says:

> If nature-study teaches anything, it teaches the mistake of counting on what one animal will or will not do, from what you have seen others of the same species do. No one knows all there is to know about animal life. Cuvier, Darwin, Wallace, Audubon, were mere beginners, and we are all babes in the world of nature. The average man does not see what is going on all about him; the scientist, lacking imagination, and following in more illustrious footsteps, sees only that which is tangible.
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> Nature-study, as we understand it today, has passed beyond the ken of the scientist who deals only in plain facts; nature-study is not an exact science, and has been handicapped by those who seek to pretend that it is. Let the scientist keep to the plain facts; that is all we want from him. But to the sympathetic nature student we look for separation of the classes into individuals and interpretation of their hundreds of little life-acts, which are quite beyond the understanding of the right-angled-triangled scientific man.
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> The old-school scientist assumes that all animals of the same class are alike, but the intelligent and experienced nature student knows that they vary in temper, in strength, even in habit; not, of course, sufficiently to disrupt class distinction, but to give them decided individuality.
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> The fact that the life of every animal is one of continuous alertness, and that nearly every one is closed in tragedy, gives wide and varied range for observation and abundant scope for the writer's imagination. We want the writer who appealingly interprets his observations, because he is a missionary doing invaluable service.
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> "Every artist does something more than copy nature; more comes out in his account than goes into the original experience"—to quote the very words I find in one of Mr. Burroughs's delightful essays. Again quoting from Mr. Burroughs: "Man can have but one interest in nature, namely, to see himself reflected or interpreted there, and we quickly neglect both poet and philosopher who fail to satisfy, in some measure, this feeling."
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> And yet it is true that if we are to accept his work as natural history, he

must not permit his fancy to carry him too far beyond the discovered facts. But facts are one thing, and conclusions drawn from observations are entirely personal and may be quite another thing. If an author makes a misstatement of fact, I note it against him as carelessness or ignorance; I may not agree with the conclusions he draws from an observation I have shared with him; I may not, in a rather wide observation afield, have seen what he has in a more limited experience — but I should beware of setting myself up as his judge and jury and publicly excoriating him, lest perchance my own ignorance stand disclosed. Every observer has a new story and new light to shed on the cat or dog or squirrel. And consider the various and varied tales of guides and trappers and hunters.

Everyone who has had even ordinary opportunities for observing nature will be able to recall many things to substantiate what Mr. Whitney says as to the peculiar traits of individual creatures. A year or two ago I had the opportunity to watch a robin that had a nest full of hungry young ones in a maple tree in a neighbor's yard. Her favorite hunting ground for worms was in the sodded door-yard of the adjoining lot, upon which stood a small barn with a wooden bridge leading up to the door. This bird, instead of carrying the worms singly to the nest as she found them, carried them to the barn bridge where she laid them down to wait until she had caught several, and then she would gather them all up and fly to her nest. It is not down in the books that the *genus* robin does this, nor have I ever known such a fact to be recorded of a robin before; yet this individual bird did discover that she could save herself some extra trips by gathering up a number of worms before leaving the hunting ground. In the same door-yard there was an educated man removing the mown grass from the lawn. To do this he gathered together a number of small piles of grass into one large heap and then carried it all off at once. We usually satisfy ourselves by referring the actions of the robin to *instinct*, but those of the man we attribute to *reason!*

I once was on more or less intimate terms with an old fox that had a large family of young housed in a deserted coal mine that entered the side of the hill about half a mile away. Naturally enough, Mrs. Reynard depended largely upon the farm-yard products for the maintenance of her family, and one time I had a chance to study her methods. She was observed, some distance away from the barn, stalking a flock of chickens. She simply *walked* after them, apparently knowing that if she became too enthusiastic in the pursuit, they might, and probably would, take wing. Finding that she was being watched, she bounded away to the den. Noticing a bunch of feathers lying in the course over which she had stalked the chickens, I proceeded to investigate, not doubting that I should find the mangled remains of a fowl. To my astonishment, instead I found a rooster, with his heels in the air, lying on his back in a shallow hole, left by a horse's foot in the soft turf, and entirely unhurt. When I set him upon his feet, he ran away, no doubt much surprised to find himself alive. The fox evidently had put the chicken on his back into this hole, at the same time hypnotizing him into the belief that he could not extricate himself. Presumably he, by following this plan up, would have secured a full load of poultry before returning to the den to face the clamoring youngsters. I subsequently tried the same experiment upon a rooster, and found that by placing him on his back, as the fox had done, I, too, could make him lie still — but I learned the trick from the fox. I have never heard of a similar observation, and cannot say whether it was a habit peculiar to this particular fox or not.

One time, in a large city, I kept an opossum as a pet for nearly a year. It is a misnomer to speak of him as such, for he never seemed to appreciate in any way the attentions he received. One day in the summer he escaped, and for a time all trace of him was lost. The following spring, hearing that a man several blocks away had killed an opossum which he had caught in his chicken-house, I visited the place and found that it was my unfortunate pet. The man said that he had been missing chickens all winter, but had been unable to find the marauder until he had actually lain in wait for him. The interesting point was to know where the creature had lived all these months following his escape. About half a mile away, but in a thickly settled district, was a shelving rocky cliff formed by the construction of a railway tunnel through a hill. It seemed most plausible that he had sought shelter and refuge in this place, but one could not be sure. The important fact was that this stupid (?) little beastie, reared in the wilds of the Blue Ridge Mountains, with certainly no opportunities of knowing city ways, had managed to support himself and remain undiscovered for nearly a year, in the midst of thousands of his most deadly enemies. Could a human being under corresponding circumstances have done any better? Would a Japanese spy get along so well if he tried to live in Russia? Yet the opossum took just such chances in staying in the city, and he must have found it necessary to invent some ways of doing things that were new and strange to the "typical possum."

Herein lies one great value in pets that can be kept under normal conditions. The child is brought face to face with the peculiar ways that a particular individual has of doing things. The knowledge thus acquired is infinitely more interesting and stimulating in the direction of further study than anything that can be gotten from books or from a more general study of types. The same principle must be applied to the study of nature that we observe in the study of human beings. No one is interested, except in a general way, for example, in the study of tailors as a class. But the study of how the individual tailor makes his way, by contriving special forms of advertising, by changing the cut of his clothes, and by other devices that are peculiar to himself, and which tend to distinguish him — all these are full of interest. The same applies to all living things. The fact that they are on the earth today shows how skilful they have been in devising ways and means of self-support. All those less skilful are embalmed in the rocks as fossils or have utterly disappeared. The survivors, therefore, should be objects of the greatest individual interest. In their own field their skill outwits our own. Were we to attempt to live by the chances taken by a kingfisher, we should have to go to school to the kingfishers for a million years. It is only through the study of the personal life of the individuals that we can have that true nature-study upon which we must depend to broaden the sympathies of the children for the world of nature at large.

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